FHWA Workshop over the Web for Travel Model Development Session 5 Homework

Validation of a Logit Model

Total Time Required: 45-60 Minutes

In this exercise, we will look at the validation of a logit mode choice model. We will assume that a model has already been estimated, and apply it to a two-zone area. We will then understand how this model can be evaluated and adjusted.

The Mode Choice Model - Background

Imodel Eks Atley is a modeler for the Faketown MPO. She estimated a work trip mode choice model for the Faketown region using a recently completed household travel diary survey and a transit onboard survey. Details of the logit mode choice model are as follows:

1. Modes Included: Non-motorized, auto, and transit.

2. Model Estimation Results: The model results are shown in **Table 1** below. These results are also included in the spreadsheet **Homework 5.xls**.

3. There are only two zones in the Faketown region. Zone 1 is a purely residential zone and Zone 2 is purely an employment zone.

Table 1. Faketown Mode Choice Model

Variable	Coefficient
Constants	
Auto	0.00
Non-motorized	-1.20
Transit	-0.50
Travel Time Coefficients	
Walk Time (for NM only)	-0.05
In-Vehicle Time (Auto and Transit)	-0.02
Out-of-Vehicle Time (Auto and Transit)	-0.05
Travel Cost Coefficients	
Cost in $ (Auto and Transit Only)	-0.30

Application of the Mode Choice Model

Imodel would like to apply the mode choice model she estimated and needs our help. Obviously, she needs the level-of-service variables to apply the model. The level-of-service data for work trips between Zone 1 and Zone 2 are shown in **Table 2**. These data are also provided in **Homework 5.xls**.

Table 2. Level-Of-Service Variables.

Level-of-Service Data	Value
Walk Time (minutes)	35
Drive Time (minutes)	15
Transit In-Vehicle Time (minutes)	25
Auto Out-of-Vehicle Time (minutes)	5
Transit Out-of-Vehicle Time (minutes)	10
Auto Travel Distance (Miles)	8
Auto Cost (cents per mile)	15
Transit Fare ($)	1

Questions

1. Calculate the utilities for auto, transit, and non-motorized modes. Please use Table 3 in the spreadsheet to organize your calculations.

2. Calculate the market shares of the auto, transit, and non-motorized modes.

3. Assuming that the true market shares of auto, transit, and non-motorized modes are 75%, 20%, and 5% respectively, how do the predicted market shares from Question 2 compare with the true market shares?

4. Let's say we would like to adjust the mode-specific constants to bring the observed and predicted market shares in line. Can you propose the new constants? You don't need to be precise, just think about whether you need to increase or decrease each constant and provide a guesstimate of what you think the new constant ought to be.